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ABSTRACT

For the dyslexic and others with similar problems, a revision of the sequence of modalities known as VAKT (for visual, auditory, kinesthetic, tactile) might achieve more effective and more rapid remediation. The new sequence is designated as TAK/v. The subordination of the visual modality is based on the recent identification of visual processing deficiency in dyslexics, as well as on previous hypotheses, suggesting the desirability of substituting the tactile modality for the visual modality in the initial stages of remediation. The use of the left hand is suggested for this tactile scanning of three-dimensional letters to access the right hemisphere. (One figure is included, and 14 references are attached.) (MG)

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If they can speak, why can't they read? And spell? They may now!

HEMISPHERIC 'ROUTING' AND 'VISION BYPASS' TO TEACH SPELLING TO DYSLEXICS

Harold Blau
Eugene J. Loveless

First, the answer to the question Why can't they read and spell? is that 'they' find that the sounds of the words they speak do not translate into the letters and words displayed before them. Unlike their peers, 'they', the terrible spellers and the terrible speller–readers, usually called dyslexics, do not fuse the letters c–a–t, for example, with their inner picture of a furry four-legged animal that says 'Meow'.

A virtual abyss separates the auditory unit and corresponding image from its visual alphabetical construct. No c–a–t meows for them and so they can speak, but not read or spell.

All remedial techniques for reading and writing difficulties have started, therefore, by teaching spelling (namely, sounds and their visual equivalents), ignoring as long as possible the problems posed by an inconsistent English orthography, at least at the beginning levels. A sound and its visual equivalent, a letter, or letters, are drilled until more or less permanently welded together, leading to word recognition and thus to reading. This is usually a slow, halting process, perpetually lagging behind the learner's immediate needs.

It is the position of this paper that these problem cases may have a better chance to spell, and also read, if they are blindfolded and taught

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the necessary letters and sounds by use of the tactile modality; that is, by feeling the letters and hearing the sounds, using the fingers instead of the eyes to scan the words and to absorb the sequence of letters. More than that, they should use the fingers of only one hand, the left, stimulating, in that way, the contralateral or opposite right hemisphere with its specialized capacity to mediate spatial relations and manual patterns (Witelson, 1976; Masland, 1979).

A brief review of prevailing methodology will serve to make clearer the contrast with the proposed revision. The best known methods are the Gillingham–Orton and the Fernald methods. The Gillingham–Orton, or VAK, system, in its original form, appeared between 1933 and 1936 (Childs, 1968). It was rigid in establishing precise sound–symbol relationships as the basis of spelling, writing and reading. It required that children with serious problems 'be removed from class when reading or writing or spelling were taught' by the prevailing visual, whole-word method.

The Fernald method had been developed over a period of almost 20 years and was brought to wide public notice with Fernald's book in 1943. Fernald's method was also highly structured, but in a different way. It emphasized the need for successful experiences and added a greater concern for motivation. Fernald started with words known to, and of interest to, the student. To learn these words, the student began with tracing the letters. He wrote stories and traced, said and wrote, then read every unknown word. Thus was added the 'tactual' component (Fernald's description of this step) or the *T* that completed the formula, VAKT. Not as well known as it should be is the fact that the use of the tactual sense was abandoned as quickly as possible in favour of looking, saying and writing procedures. Phonics was taught, but incidentally, not in the step-by-step Gillingham method. While VAKT has almost as many meanings as there are practitioners, it is now almost a reflex response to spelling difficulties and reading–spelling handicaps, regardless of aetiology, all over the world.

The concept of the visual modality as a disturbing element in remediation, at least with certain children, is not as novel as it would seem. Montessori (1912) used blindfolding to improve sensory skills and recognition and recall of letters simply on the basis of her unique appreciation of the need of individual children. It was Schwalb and Blau (1968), paediatrician and educator, however, who were the first to declare specifically that the bilateral visual process was the probable culprit in dyslexics. Blau and Blau (1969) reported on a technique called 'modality blocking' or a 'non-V, AKT' method — auditory, kinaesthetic, tactile — for children with bizarre spelling and poor reading. In addition to blindfolding the child they borrowed Fernald's tracing technique, but used three-dimensional letters before allowing the child to see and write the word. The letters could be easily scrambled and rearranged, using both hands.

From 1968 on, acceptance of the theory that the visual modality was a matter of concern, and that the tactile modality had been underestimated, was relatively rapid. Gearhart (1973) included a reference to modality blocking and blindfolding. Miccinatti (1979) offered it among suggested modifications of the Fernald system.

When hemispheric function or specialization was not as well comprehended, it is understandable that not enough emphasis would be placed on the importance of speech, the one component with which the child was equipped and which indicated at least an intact auditory modality. If subsequently (and not until reaching school) he could not conquer visually dominated tasks such as reading and spelling, then the visual modality should have been seen much earlier as the probable locus of the disability. It should certainly be apparent now, and this is occurring.

Experimental evidence has recently developed. The most important one is that of Pavlidis, an English researcher. His findings were that dyslexics could be distinguished from poor readers and from normal readers on the basis of eye movement characteristics, especially eye movement regressions which 'were so frequent, so big in size, and idiosyncratic that they might be considered to be a distinguishing factor between dyslexics and other readers' (1979). He also investigated sequencing alone, or exposure to lights that lit up one at a time in a horizontal array for one second each from left to right. Dyslexics were unable to follow the sequence accurately. Pavlidis hypothesized regarding a 'constitutional . . . oculomotor sequencing disability, whatever the stimuli, visual, non-verbal, and cross-modal.'

The importance of this cannot be underestimated. The technique developed independently, and presented in this paper, may be termed a 'bypass' technique for the visual problem hypothesized by the authors and apparently validated by Pavlidis.

In 1977 van den Honert, seeking a frankly neurological technique for training her 'dyslexic' population, reported that she poured rock and roll music into the left ear with stereophonic earphones, thus blocking the right hemisphere, and communicated reading instruction through the right ear into the left hemisphere, both simultaneously. In addition, she blacked out the left lens of a pair of sunglasses, again to inhibit right hemisphere mediation, she thought, and knocked out the right lens, forcing use of one eye and, she thought, the left hemisphere. Result? She found the learning of reading by her young 'dyslexics' enormously accelerated but the older ones changed disappointingly less. Spelling did not change, or was not so reported. The blocking of a part of the visual modality can now be seen as another effort towards emancipating remediation for handicapped children from the VAKT or visually dominated lock-step. It lacks experimental validity because visual field restraints are an extremely difficult experimental procedure. Her emphasis on right ear input was probably of greater importance. The global use of the term 'reading' was another deficiency. The multitude of separate skills which enter into this process will probably make necessary many different and delicate variations in modality input in problem cases.

The history of attempts to alter, or retrain brain function by motor activities, so as to change learning patterns is a somewhat barren one (Kephart, 1960; Delacato, 1963; Barsch, 1967). If, however, we speak of 'cognitive strategies', there seems to be more acceptance of proposed change as having a basis in fact and physiology. For the experimenters, the obvious problem

was whether one hemisphere or another could be encouraged to develop a more efficient strategy for poor spellers. The experimental paradigm was thus set up to contrast the efficiency of left hemisphere–right hemisphere retention of spelling by routing the information to the left or right hemisphere according to the hand utilized by the child, without any reliance upon visual perception. Simply 'not looking', blindfolding, 'looking away', or closing the eyes, were insufficient. The use of blackened goggles turned out to be the best way to render the visual modality inoperative. This was termed 'deflecting the modality'. It is hypothesized that blood flow in the primary visual cortex is reduced (it can never be eliminated, of course) by the consequent elimination, not only of light, but also of muscle stimuli. The processing of the spatial and configurational details of words in handicapped children is seen as so fragile that even such artefacts as irrelevant muscle stimuli are worth inhibiting if possible, especially in and around the eyes.

The first experiment was a naturalistic observation reported earlier by Loveless and Blau (1980). In this study they reported on the success of two children who were taught to spell with the TAK/v method. Their progress is depicted in Figure 1.

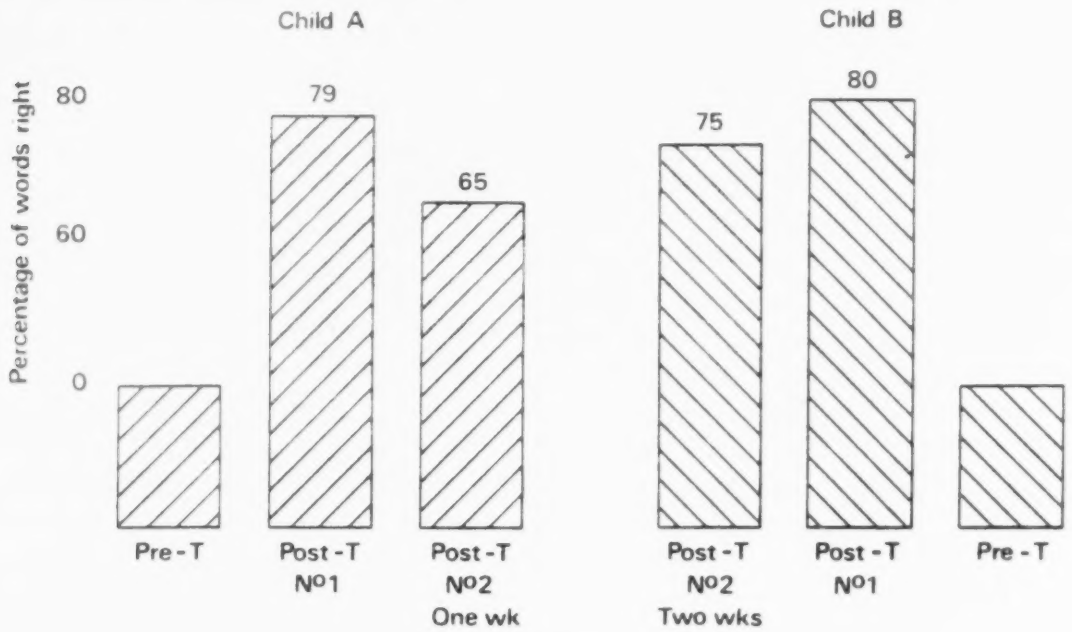

Figure 1

The second investigation was more ambitious. In this study a rigorously structured procedure was used in which words, originally misspelled by the child, were taught in a tactile fashion without initial visual aid, and by following the TAK/v sequence. They were taught by way of both the right hand and left hand in a counterbalanced order. The children were ten males, all right handed, of normal IQ, and from 9 to 12 years of age. Each had a diagnosed learning disability in the area of spelling.

A spelling test was selected with well-defined alternative equated lists

(Morrison–McCall, 1923). For each child, individually, five words, the first five the subject could not spell orally, were selected from the first two lists, and were identified as Groups A and B. Seated beside the experimenter, and with darkened goggles in place, the subject was told the first word and then three-dimensional letters were placed in one hand, in proper sequence, one at a time. The subject felt each one with the fingers of that hand only, saying the letters or the letter and its sound, and pronouncing the word each time the experimenter did, as a kind of an echo. In this way the tactile and auditory modalities were utilized.

After three such sequencing runs, the letters were scrambled, and still using the same hand, the subject would restore them to proper sequence, goggles still in place. Each letter and word continued to be verbalized. This too was done three times. Still masked, the subject was instructed to write the word three times as best he could — the kinaesthetic input. The examiner guided his hand to a convenient point on the paper. Then the goggles were removed. The subject looked at the letters he had been touching. They were then removed. The subject now wrote the word three times from memory; each one covered to avoid copying. This was the visual component, or 'revisualization'. If the subject made an error at any point, the process was repeated. This was rare. When it occurred, it was necessary to run through the procedure only once again. Of the ten cases not one had any visible difficulty with correct immediate recall of a word. In testing, the results were different.

Examined as individual cases, on an immediate recall basis, following the teaching trials, every case either favoured the left hand, or was neutral, meaning neither right nor left was preferred. In seven of these ten cases, more words were retained when the words were taught to the left hand than to the right hand ($P < 0.02$, Wilcoxon Signed Ranks Test). The direction of the differences between the hands, on delayed recall, did not reach significance, however.

When the percentage of words recalled was examined, it was significant for the sum of the left hand trials. Immediate recall was 82 per cent for the left hand and 52 per cent for the right ($P < 0.01$ ($X^2 = 51.57$)). The results for the left handed delayed retention yielded 65 per cent for the left hand and 46 per cent for the right ($X^2 = 38.2$, $P < 0.01$).

These results offer some support for suggesting the primacy of the left hand for teaching language in a tactile fashion to disabled readers. We feel, of course, that these results are exploratory rather than definitive due to the small sample size. We are at variance with Orton and his followers (1937, 1966) by attempting to capitalize on the strengths of the child and by attempting to develop a more efficient right hemisphere learning process rather than to attempt to convert this right hemispheric grapheme process to a left hemispheric grapheme–phoneme process.

Summary

For the dyslexic and others with similar problems, it is suggested that the sequence of modalities known as VAKT be revised to achieve more effective and more rapid remediation. The new sequence is designated as TAK/v. The subordination of the visual modality is based on the recent identification of a visual processing deficiency in dyslexics, as well as on previous hypotheses, suggesting the desirability of substituting the tactile modality for the visual modality in the initial stages of remediation. The use of one hand is suggested for this tactile scanning of three-dimensional letters to access the right hemisphere, and experimental data are reported.

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